

WHAT IS CLAIMED IS:

1. A marine drive comprising a drive body, a propulsion device extending from the drive body, a transmission coupled with the propulsion device, and a shift mechanism arranged to move the transmission between a first position in which the propulsion device is set to a first mode and a second position in which the propulsion device is set to a second mode, the shift mechanism comprising a shift unit linearly movable between a first shift position and a second shift position, the transmission moving to the first position while the shift unit moves toward the first shift position, the transmission moving to the second position while the shift unit moves toward the second shift position, and an electrically operable shift actuator supported by the drive body, the shift actuator having an actuating member detachably coupled to the shift unit.

2. The marine drive as set forth in Claim 1, wherein the actuating member linearly extends and retracts relative to a housing of the shift actuator along an axis of the actuating member.

3. The marine drive as set forth in Claim 2, wherein the axis of the actuating member coincides with an axis of the movement of the shift unit.

4. The marine drive as set forth in Claim 2, wherein the axis of the actuating member is skewed with respect to an axis of the movement of the shift unit, the actuating member comprises first and second sections pivotally coupled with each other, the first section extends from the housing of the actuator, and the second section is coupled with the shift unit to pivot about an axis of the shift unit.

5. The marine drive as set forth in Claim 2, wherein the axis of the actuating member is skewed with respect to with an axis of the movement of the shift unit, and the housing of the actuator is pivotally coupled to the drive body.

6. The marine drive as set forth in Claim 2, wherein the actuating member comprises first and second sections detachably coupled with each other, the first section extends from the housing of the actuator and the second section extends from the shift unit.

7. The marine drive as set forth in Claim 2, wherein the shift actuator comprises an electromagnetic solenoid.

8. The marine drive as set forth in Claim 1, wherein the shift actuator comprises a rotary shaft, the actuating member is coupled with the rotary shaft through a lever that pivotally moves when the rotary shaft rotates.

9. The marine drive as set forth in Claim 8, wherein an axis of the actuating member is skewed with respect to an axis of the movement of the shift unit, and the lever is pivotally connected to the actuating member.

10. The marine drive as set forth in Claim 1, wherein the shift mechanism additionally comprises a guide member that defines a slot having a linear axis, and the shift unit is slideably movable along the linear axis of the slot.

11. The marine drive as set forth in Claim 1, wherein an operating member is coupled with the shift unit in addition to the actuating member.

12. The marine drive as set forth in Claim 1, wherein the shift mechanism additionally comprises a second shift unit coupled with the first shift unit, the second shift unit is positioned closer to the transmission in a connection linkage of the shift mechanism.

13. The marine drive as set forth in Claim 1 additionally comprising a prime mover that powers the propulsion device, either the first or second modes of the propulsion device being a neutral mode in which the propulsion device is disconnected from the prime mover, the shift mechanism additionally comprising a neutral position sensor that senses that the shift unit is placed at the respective one of either the first or second shift positions that corresponds to the neutral mode of the propulsion device.

14. The marine drive as set forth in Claim 13, wherein the neutral position sensor is a neutral position switch disposed adjacent to the shift unit or the actuating member, and the movement of the shift unit or the actuating member to effect the neutral mode activates the neutral position switch.

15. A marine drive comprising a drive body, a propulsion device extending from the drive body, a transmission coupled with the propulsion device, and a shift mechanism arranged to move the transmission between a first position in which the propulsion device is set to a first mode and a second position in which the propulsion device is set to a second mode, the shift mechanism comprising a shift unit pivotally movable between a first shift position and a second shift position, the transmission moving to the first position while the shift unit moves toward the first shift position, the transmission moving to the second position while the shift unit moves toward the second shift position, and an electrically operable shift actuator supported by the drive body, the shift actuator having a rotary shaft and an actuating member coupled with the rotary shaft and with the shift unit.

16. The marine drive as set forth in Claim 15, wherein one end of the actuating member is coupled with the rotary shaft through a lever that pivotally moves when the rotary shaft rotates, and another end of the actuating member is pivotally coupled with the shift unit.

17. The marine drive as set forth in Claim 15, wherein the actuating member comprises a first gear coupled with the rotary shaft, and the shift unit comprises a second gear meshing the first gear.

18. The marine drive as set forth in Claim 17, wherein a third gear meshes with one of the first or second gears, a shift position sensor cooperates with the third gear to sense a position of the shift unit.

19. A marine drive comprising a drive body, a propulsion device extending from the drive body, a transmission coupled with the propulsion device, and a shift mechanism arranged to move the transmission between a first position in which the propulsion device is set to a first mode and a second position in which the propulsion device is set to a second mode, the shift mechanism comprising a shift unit pivotally movable between a first shift position and a second shift position, the transmission moving to the first position while the shift unit moves toward the first shift position, the transmission moving to the second position while the shift unit moves toward the second shift position, and an electrically operable shift actuator supported by the drive body, the shift actuator having a rotary shaft and an actuating member coupled with the rotary shaft and with the shift unit, the actuating member comprising first and second sections pivotally coupled with each other, the first section linearly extending and retracting relative to a housing of the shift actuator along an axis of the first section, the second section pivotally coupled with the shift unit.

20. A marine drive comprising a drive body, a propulsion device extending from the drive body, a transmission coupled with the propulsion device, and a shift mechanism arranged to move the transmission between a first position in which the propulsion device is set to a first mode and a second position in which the propulsion device is set to a second mode, the shift mechanism comprising a shift unit pivotally movable between a first shift position and a second shift position, the transmission moving to the first position while the shift unit moves toward the first shift position, the transmission moving to the second position while the shift unit moves toward the second shift position, and an electrically operable shift actuator supported by the drive body, the shift actuator having a rotary shaft and an actuating member coupled with the rotary shaft and

with the shift unit, the actuating member linearly extending and retracting relative to a housing of the shift actuator, the housing of the shift actuator swingably affixed to the drive body.

21. A marine drive comprising a drive body, a propulsion device extending from the drive body, a transmission coupled with the propulsion device, and a shift mechanism arranged to move the transmission between a first position in which the propulsion device is set to a first mode and a second position in which the propulsion device is set to a second mode, the shift mechanism comprising a shift unit movable between a first shift position and a second shift position, the transmission moving to the first position while the shift unit moves toward the first shift position, the transmission moving to the second position while the shift unit moves toward the second shift position, an electrically operable shift actuator supported by on the drive body, the shift actuator having an actuating member coupled with the shift unit, and a shift position sensor that senses a position of the shift unit placed between the first and second shift positions.

22. The marine drive as set forth in Claim 22, wherein the shift position sensor is disposed near the shift actuator to sense a position of the shift actuator that corresponds to the position of the shift unit.

23. The marine drive as set forth in Claim 22, wherein the shift position sensor is disposed in a housing of the shift actuator to sense a position of the shift actuator that corresponds to the position of the shift unit.

24. The marine drive as set forth in Claim 22 additionally comprising a prime mover that powers the propulsion device, either one of the first or second modes of the propulsion device being a neutral mode in which the propulsion device is disconnected from the prime mover, the shift mechanism additionally comprising a neutral position sensor that senses when the shift unit is placed at either of the first or second shift positions which corresponds to the neutral mode of the propulsion device.

25. A marine drive comprising a propulsion device, a prime mover that powers the propulsion device, a transmission coupled with the propulsion device, and a shift mechanism arranged to move the transmission between a first position in which the propulsion device is set to a first mode and a second position in which the propulsion device is set to a second mode, the shift mechanism comprising a shift unit movable between a first shift position and a second shift position, the transmission moving to the first position while the shift unit moves toward the first shift position, the transmission moving to the second position while the shift unit moves toward the second shift

position, and an electrically operable shift actuator having an actuating member coupled with the shift unit, the shift actuator affixed onto a surface of the prime mover.

26. A watercraft comprising a marine drive, a shift operating device and a control device, the marine drive comprising a propulsion device, a transmission coupled with the propulsion device, and a shift mechanism arranged to move the transmission between a first position in which the propulsion device is set to a first mode and a second position in which the propulsion device is set to a second mode, the shift mechanism comprising a shift unit movable between a first shift position and a second shift position, the transmission moving to the first position while the shift unit moves toward the first shift position, the transmission moving to the second position while the shift unit moves toward the second shift position, and an electrically operable shift actuator having an actuating member coupled with the shift unit, the shift operating device providing a shift position command to the control device, the control device controlling the shift actuator to move the actuating member based upon the shift position command, the shift operating device having a control member movable between a first control position corresponding to the first shift position and a second control position corresponding to the second shift position, and a position sensor arranged to sense a control position of the control member or a shift position of the shift unit and to send a shift position command signal to the control device.

27. A watercraft comprising a marine drive, an internal combustion engine, a shift operating device and a control device, the marine drive comprising a propulsion device powered by the engine, a transmission coupled with the propulsion device, and a shift mechanism arranged to move the transmission between a first position in which the propulsion device is set to a neutral mode and a second position in which the propulsion device is set to a propulsion mode, the shift mechanism comprising a shift unit movable between a first shift position and a second shift position, the transmission moving to the first position when the shift unit moves to the first shift position, the transmission moves to the second position when the shift unit moving to the second shift position, and an electrically operable shift actuator having an actuating member coupled with the shift unit, the shift operating device providing a shift position command to the control device, the control device controlling the shift actuator to move the actuating member based upon the shift position command, the shift operating device having a control member movable between a first control position corresponding to the first shift position and a second control position corresponding to the second shift position, and a neutral position

sensor arranged to sense the control member placed at the first control position or the shift unit placed at the first shift position and to send a neutral position command signal to the control device.

28. The watercraft as set forth in Claim 29, wherein the control device controls the engine not to start operating when the control device receives the neutral position command signal from the neutral position sensor.